Topical Gentamicin Prophylaxis with Tympanostomy

SINCE THE MODERN INTRODUCTION over 30 years ago of myringotomy with ventilating tube placement as a treatment for the various manifestations and complications of eustachian tube dysfunction, the use of this procedure has increased to where it is now reportedly done ½ to 3 million times per year. The most common complication is purulent otorrhea in the early postoperative period, occurring in from 10% to 34% of patients in various large series. Prompt resolution is the rule after one or more sessions of clearing the purulence and instilling otic drops in the ear of a more or less cooperative child. Oral antibiotics are often used also. The long-term consequences are minimal, but the inconvenience, anxiety and expense generated are significant.

Some authors and many practitioners have suggested and used various prophylactic techniques in attempting to minimize this troublesome problem. At least one prospective series has indicated that perioperative oral or topical administration of antibiotics may be useful, but statistical significance was not achieved. Our study is a randomized, prospective clinical trial comparing a single outcome variable: purulent otorrhea in the first 14 postoperative days in a control group (N=46) and a treatment group (N=56) that receives gentamicin ophthalmic drops in the ears for four days beginning in the operating room. Features of the history and management of the infected patients were also evaluated. Only a trend toward younger age in the patients and postoperative otorrhea were recognized.

Of the 102 patients, "early" purulent otorrhea developed in 9 and all of these were in the control group, thus yielding a *P* of greater than .001. It should be noted that the ototoxicity of topical propylene glycol and most of the antibiotics in otic drops has been established in animal models. Gentamicin is no exception. In years of experience with thousands of patients, however, neurosensory hearing loss has not been associated with the use of these preparations for this purpose.

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Photoactive Therapy for Head and Neck Cancer

THE PECULIAR PROPERTY of a number of organic compounds in biologic systems to respond to incident light by releasing energy has been known for a long time. Among the most active of these compounds are the porphyrins. The reaction of the skin of porphyria victims to sunlight with erythema and blistering is an example of the tissue-destructive effects of photoactivation. In recent times, this ability of porphyrins to release energy when activated by light has been exploited to selectively destroy tumors.

When hematoporphyrin derivative (HPD) is stimulated by light frequencies of between 400 and 600 nm, there is the release of a singlet oxygen radical that is toxic to tissues. In addition, a direct effect of the energy release results in changes in the plasma membrane of cells, causing cell death. In tumors, ischemic necrosis occurs due to destructive influences on the vascular supply.

Although photoactivation can be stimulated by a high-intensity white light, it is most effectively stimulated with the beam from an argon-pumped dye laser. A patient is injected with HPD at a dose of 3.0 mg per kg body weight, and the dye is allowed time to concentrate within the tumor (about 72 hours). The lesion is then exposed to 30 to 150 joules (watts per seconds) of laser light per cm^2 of tumor surface area. Over the ensuing 24 to 96 hours, the exposed tumor undergoes coagulation necrosis to a depth of 2 cm from the exposed surface. In another application of this technique, multiple areas of carcinomatous involvement of selected tissues are both detected and ablated, such as the multifocal basal and squamous cell carcinomas of sun-damaged facial skin or the "condemned mucosa" of the oral cavity in patients with field cancerization. Tumor sites are identified by "tuning" the dye laser to a frequency in the blue-green range that will cause the tumors to fluoresce (488 to 515 nm), then resetting the frequency to the red end of the spectrum that will cause necrosis (625 to 635 nm).

The most serious drawback of the technique is the problem of tumor specificity of the photoactive agents. Although tumors selectively take up HPD due to the vascular permeability of their capillaries, epithelial cells also bind the porphyrins, albeit to a much lesser but unfortunately significant degree. Therefore, a patient's skin remains sensitive to sunlight and strong fluorescent light for four to six weeks after injection. This problem can likely be circumvented—and specificity enhanced—by conjugating HPD with a tumor-specific monoclonal antibody. The antibody will selectively bind to the cell membrane of the malignant cell, but not to the neighboring healthy tissues. Laboratory experimentation directed to this objective is currently being actively pursued.

At present the use of this technique has been limited to diagnosing and treating multifocal basal cell carcinomas of the face and field cancerization of the oral cavity. Some clinical trials on larger tumors have been attempted with mixed results. Further modifications in the technology and methods of this therapy have great promise.

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Anterior Cricoid Split

NEONATAL INTENSIVE CARE units have come into being in the past 20 years. With these units, the use of prolonged endotracheal intubation is commonplace. The incidence of acquired subglottic stenosis is now estimated to be near 8% in premature infants who have had an endotracheal tube.

The subglottic space is unique in that it is encased by the circumferential cartilage of the respiratory tract, the cricoid cartilage. Mechanical irritation by the endotracheal tube causes mucosal edema, ulceration and granulation tissue formation. As the subglottic space is the only area that cannot expand to accommodate these changes, the injury to this area